

# HardLine<sup>®</sup> centerless heat treatment machines

An introduction to the CC and CP systems



# Cutting costs with HardLine centerless systems

EFD Induction's HardLine centerless heat treatment systems are field-proven solutions that deliver the short cycle times, reproducibility and reliability needed when mass producing steel bars and shafts. Available in Centerless Continuous and Centerless Pusher versions, these systems are used by many of the world's leading manufacturing companies. The main benefits of HardLine centerless systems are:

## **Reduced capital costs**

As each HardLine centerless heat treatment system handles a wide spectrum of workpiece dimensions, you need fewer dedicated machines.

## **Reduced operating costs**

Advanced CNC systems, state-of-the-art inductors and reliable power sources mean maximum uptime, optimal outcomes and minimal waste.

## **Streamlined production**

Fast, automated induction hardening is ideal for in-line integration.

## **High throughput**

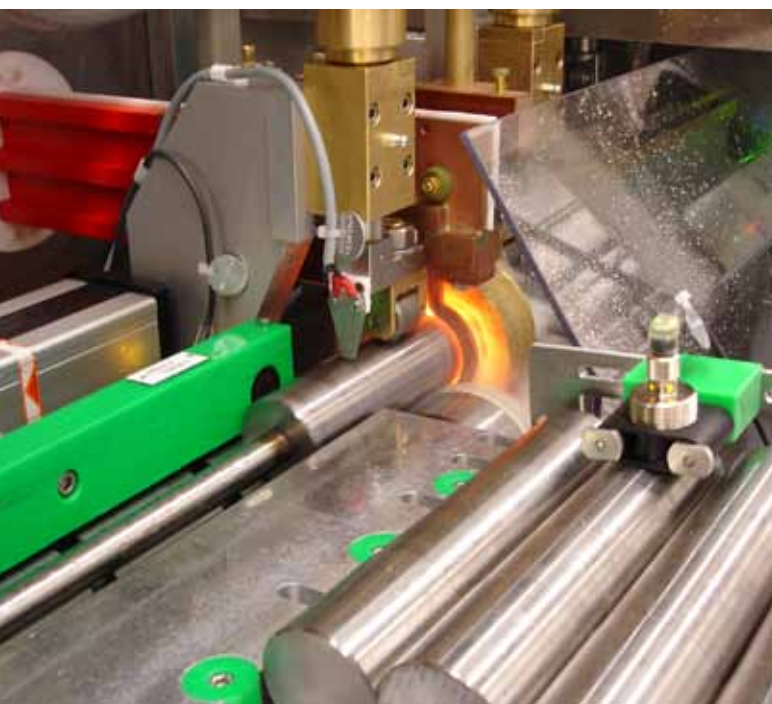
Programmable heating and quenching cycles, automated loading/unloading systems, and tried-and-tested components ensure high throughput rates.

## **Improved operator productivity**

Smart ergonomic design and easy-to-use control interfaces improve operator productivity.

## **Customized solutions**

HardLine centerless systems are modular; subsystems and options can be added to meet your specific requirements. You avoid paying for redundant features.



*High throughput and consistent heating outcomes are essential when heat treating bars and shafts. Left, a HardLine Centerless Pusher hardens steel bars.*

# HardLine Centerless CP 600 and CP 1200

These high-throughput Centerless Pusher (CP) machines are ideal for plain shafts requiring precise hardening. Standard CP systems can handle workpieces up to a maximum length of 600 or 1,200 mm, and diameters of 8–50 mm. In special cases workpieces up to 8 meters can be treated. CP models with twin pusher feeds that effectively double throughput are available.

A loading magazine is standard on all basic CP systems. Unloading is via a V-guide, and the horizontal feed is powered by a CNC-controlled servomotor. Hardened rollers with stainless steel bearings rotate the workpieces. The hardening and quench area is completely enclosed. The central lubrication system is manually operated. All our CP machines are powered by EFD Induction Sinac generators.



# HardLine Centerless CC 300 and CC 600

With throughput speeds of up to 12 m/min., our Centerless Continuous (CC) hardening systems offer unrivalled productivity—particularly when integrated into production lines. CC systems are available for workpiece lengths of 300 or 600 mm, and diameters of 6-30 mm. Standard CC machines feature a conveyor belt with inlet and automatic speed control. All our CC machines are powered by EFD Induction Sinac generators.

The workpieces are rotated by hardened rollers with stainless steel bearings. The hardening and quench area is completely enclosed. Rejects are automatically separated. Hand wheels allow quick and easy change-overs between workpiece groups. A discharge belt with jam control is also available. This optional feature automatically starts and stops the machine when no workpiece is on the line.



# Options and controls for maximum productivity

Each HardLine centerless heat treatment machine can be fitted with various options to adapt the machine to your specific process requirements. Some of the options available are:

- Automated loading/unloading solutions increase throughput and make it possible to integrate the hardening machine into a production line.
- Integrated or separate tempering stations further lower costs by eliminating off-site processing.
- Reject chutes help maximize throughput by maintaining production while safely removing rejects.
- Horizontally moving inductors are available for our CP systems; these inductors facilitate groove hardening and edge hardening with pre-heating.

## CP controls

All HardLine CP systems feature an advanced CNC solution based on one of the world's most trusted platforms. The specific type of CNC used depends on the machine model and processing requirements. The CNC control unit is mounted on the machine body,

while the system interface is field-located close to the operator. Functionality can be expanded by adding options such as network connections, printing protocols and database capabilities. A key feature of the CNC solution for our CP machines is the use of absolute encoders. These eliminate time-consuming system referencing otherwise needed on start-up.

## CC controls

Standard EFD Induction CC machines feature a High-Speed Control solution with a reaction time of only 1 $\mu$ s. An ultra-accurate sensor—that is easily mounted in front of or behind the inductor—detects the workpiece edge and controls the hardening program. This enables safe and reproducible heat treatment of completely plain shafts without journals, even with narrow hardness tolerances at high line speeds. The control terminal is easy-to-use, featuring a 12" screen, multilingual displays and online documentation via the control PC. Options include printer capability, and an Energy Measuring System that stores key energy consumption data.



*A typical operator terminal from a HardLine centerless heat treatment system. Our control systems are built on platforms from one of the world's most trusted suppliers.*

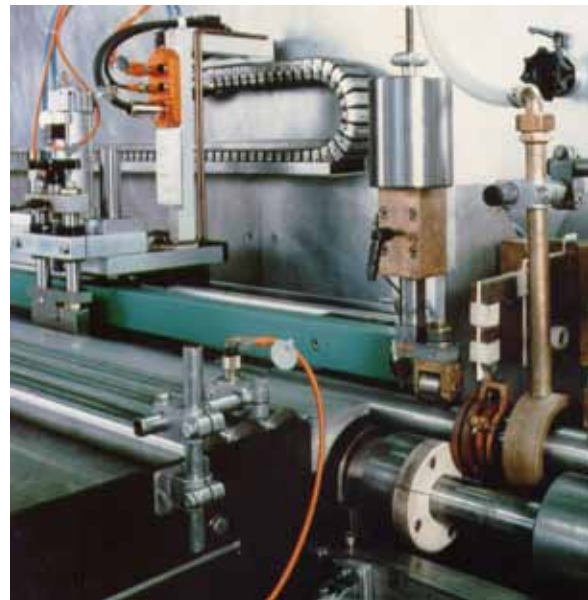
# Get more from your equipment

When you choose a solution from EFD Induction you choose security and peace-of-mind. As one of the world's largest induction heating companies we offer a

full range of maintenance, logistics, training and spares services. Make the most of your heating system—with a little help from the people who built it.



*The belt drive mechanism on a HardLine Centerless Continuous heat treatment machine.*



*A close-up of the pusher mechanism on a HardLine Centerless Pusher heat treatment machine. This version features a lifting device.*

EFD Induction has to date installed thousands of heating solutions for a vast range of industrial applications—bringing the benefits of induction technology to many of the world's leading manufacturing and service companies. EFD Induction has manufacturing plants, workshops and service centers in the Americas, Europe and Asia.

**Learn more about the EFD Induction solutions that are boosting productivity for companies around the world. Visit: [www.efd-induction.com](http://www.efd-induction.com)**